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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Application of: John W. Evans, et al.

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) Art Unit: 1751  
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) Examiner: Hamlin, D.  
)

on: Non-Aqueous Heat Transfer  
Fluid and Use Thereof

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Serial No.: 09/910,497

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Filed On: July 19, 2001 (Docket No. 290397.0007)

Dated at Hartford, Connecticut this 8th day of August, 2003

Commissioner for Patents  
Washington, D.C. 20231

RESPONSE TO OFFICE ACTION

Dear Madam/Sir:

In response to the Office Action mailed on April 8, 2003, Applicants respectfully  
request reconsideration of the above-referenced application for the reasons set forth  
below.

The Applicants thank the Examiner for the courtesy extended in the telephonic interview conducted on July 16, 2003.

In the Office Action, the Examiner maintained the rejection of all of the pending claims, claims 1-29 and 40-50 as amended, under 35 U.S.C. §103(a) over Maes et al., U.S. Patent No. 5,366,651, for the reasons set forth in the Office Action previously mailed on November 6, 2001. Applicant respectfully requests reconsideration of the rejection of the pending claims for at least the following reasons, each of which is discussed in detail below: (1) the rejection of claims 1-29 and 40-50 based on Maes is improper because the reference when considered as a whole does not teach or suggest combining ethylene glycol with another diol to form a reduced toxicity, non-aqueous heat transfer fluid, and the Examiner did not address this argument in the Office Action; and (2) the rejection of claims 5, 13, 28-29 and 40-50 based on Maes is improper for the additional reason that Maes does not teach or describe mixing ethylene glycol and propylene glycol in any specific proportions, much less the proportions set forth in claims 5, 13, 28-29 and 40-50 which produce the unexpected result of a reduced toxicity non-aqueous heat transfer fluid.

As set forth in claims 1-29 and 40-50 as amended, the present application is directed to a non-aqueous heat transfer fluid having reduced toxicity. As set forth in amended Claim 1, the heat transfer fluid comprises ethylene glycol, at least one additional diol which acts as an inhibitor for ethylene glycol poisoning, and at least one corrosion inhibitor additive that is soluble in ethylene glycol and the additional diol. As set forth in claims 4, 5, 13, and 15 - 24, in one embodiment, the additional diol which acts as an inhibitor for ethylene glycol poisoning is propylene glycol. As further set forth in amended claims 27 - 29 and claims 40 - 50, the present application is also directed to methods for reducing the toxicity of existing ethylene glycol based fluids by adding a

second diol, such as propylene glycol, which reduces the toxicity of the ethylene glycol based fluid.

As described in the specification at, inter alia, pages 11 and 14-15 and as recited in the amended claims, the heat transfer fluid of the present invention is used as a coolant without the addition of any water. As described in the specification at, inter alia, pages 15-17, the heat transfer fluids of the mixtures described and claimed in the present application exhibit the necessary physical properties, such as, for example, viscosity and vapor pressure, to function effectively in most applications. Moreover, as described in the specification at, inter alia, pages 18-21, the non-aqueous heat transfer fluids of the present invention unexpectedly exhibit a reduced oral toxicity than would be predicted based upon the oral toxicity of the major components, such as ethylene glycol or propylene glycol.

Maes is directed to a corrosion inhibitor for use in aqueous solutions, and to antifreeze/coolant compositions containing such a corrosion inhibitor. See Maes at Col. 1, line 8. Maes states that the invention described therein “is directed to a novel corrosion inhibitor composition for use in aqueous systems, an antifreeze/coolant concentrate containing the inhibitor composition and aqueous antifreeze/coolant compositions containing the inhibitor composition.” See Maes at Col. 2, lines 54-58. Thus, Maes is directed primarily toward the corrosion inhibitor used in aqueous antifreeze/coolants. As set forth in the Maes specification and the claims, Maes describes a fluid for use in aqueous solution comprising “*a* water soluble liquid alcohol freezing point depressant and a corrosion inhibitor comprising carboxylic acids or their salts and a triazole compound . . . .” Maes at Col. 2, lines 62-65 (emphasis added). See also Maes at Col. 9, lines 25-26 (claim 1 directed to a concentrate comprising “*a* water soluble

freezing point depressant”)(emphasis added). Accordingly, Maes describes a composition having a single water soluble liquid freezing point depressant.

In the November 6, 2001 Office Action cited by the Examiner, the Examiner erroneously states that Maes describes an anti-freeze concentrate comprising water-soluble liquid alcohol freezing point depressants, i.e. that Maes describes combinations or mixtures of water-soluble liquid alcohol freezing point depressants. Applicants respectfully disagree. Maes does not teach or suggest combining ethylene glycol with a second diol for any purpose, much less for the purpose of forming a non-aqueous heat transfer fluid having reduced toxicity. The Examiner’s erroneous reading of Maes is based entirely on a single sentence at Col. 3, line 65 to Col. 4, line 8. In this sentence, however, Maes does not suggest combining two or more liquid alcohol freezing point depressants. Rather, Maes is merely listing alcohol freezing point depressants which may be used as the major component in the aqueous antifreeze compositions described in Maes. The sentence cited by the Examiner does not teach or suggest combining ethylene glycol with a second diol for any purpose, much less to form a non-aqueous, reduced toxicity heat transfer fluid as described in the present application and claimed in amended claims 1-26.

Moreover, Maes does not teach or suggest a method to reduce the toxicity of ethylene glycol based fluids by adding a second diol, such as propylene glycol, to form a heat transfer fluid having reduced oral toxicity as set forth in the methods of claims 27-29 and 40-50.

The Examiner’s erroneous reading of Maes is a result of reading one sentence in the specification out of context. A rejection under 35 U.S.C § 103 cannot be based on a single sentence taken out of context without considering the remainder of the specification. The Courts have held that “it is impermissible within the framework of

section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.” In re Wesslau, 353 F.2d 238, 147 U.S.P.Q. 391 (CCPA 1965).

In Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443, 230 U.S.P.Q. 416 (Fed. Cir. 1986), cert. denied, 484 U.S. 823 (1987), the Federal Circuit reversed a finding of obviousness based on a hindsight analysis based upon a single sentence in a reference taken out of context. The Court stated that the sentence in the reference had to be read in context. The Court held that it was improper hindsight analysis to take a single line from the reference and view that single line in light of the teaching of the patent at issue to find obviousness. Id. at 448-49.

In the sentence cited by the Examiner at column 3, line 65 through column 4, line 8, Maes provides a listing of water-soluble alcohols that may be used in the invention. Maes refers to “depressants” in the plural only in the context of introducing the listing of substances “which can be employed as major components in the present composition”. Col. 3, line 68 to Col. 4, line 1. Maes does not teach or suggest using combinations or mixtures of more than one alcohol freezing point depressant. For example, in the sentence cited by the Examiner, Maes does not state that combinations or mixtures of the listed substances could be used in the compositions described in the patent.

Moreover, throughout the specification and claims, Maes refers solely to the use of a single water-soluble liquid alcohol freezing point depressant as the major component in the anti-freeze compositions described therein. All of the 16 examples provided by Maes contain only ethylene glycol as the alcohol freezing point depressant. Col. 5, line 3 to Col. 6, line 54. In claim 1, the only independent claim in Maes, the composition is described as containing “*a* water soluble alcohol freezing point depressant.” (emphasis

added). Accordingly, when the specification and the claims are read as a whole, it is plain that Maes teaches only the use of a single alcohol freezing point depressant in the composition described in Maes.

In this case, the Examiner has engaged in precisely the type of improper hindsight analysis rejected by the Court in Bausch & Lomb, Inc. The Examiner has based the rejection under 35 U.S.C. § 103 upon a single sentence from a reference taken out of context, and viewed that line in light of the teaching of the present application regarding the combination of ethylene glycol and a second diol to support a finding of obviousness. When considered as a whole, the Maes reference clearly describes only the use of a single glycol as a major component of the antifreeze formulation described therein.

In the most recent Office Action, the Examiner states his belief that the Applicant is rehashing arguments previously made. Applicant respectfully maintains that this is not the case. In fact, Applicant has set forth a detailed explanation why the Examiner's rejection based on a single sentence of the Maes reference is improper. Applicant's argument included citation to relevant case law and a detailed review of the Maes reference which fully explains why, when Maes is read as a whole, it does not render the invention of claims 1-29 and 40-50 obvious. Applicant respectfully submits that the Examiner has not addressed Applicant's arguments or clearly articulated how the Maes reference read as a whole supports the rejection of the claims. Applicant respectfully requests that the Examiner reconsider the Maes reference in light of Applicant's arguments. If the Examiner decides to repeat any of these rejections, the Examiner is requested to issue a new non-final Office Action that completely articulates the basis for the rejection, including the evidence that the Maes reference, taken as a whole, suggest the combination set forth in the application.

Even if the Maes reference is read in the manner suggested by the Examiner, which Applicants maintain is incorrect, the Maes reference cannot support the rejection of claims 5, 13, 28-29 and 40-50. Maes does not teach or suggest mixing ethylene glycol with a second diol in any particular quantity. As set forth in detail in the application at, for example, pages 18-21, the Applicants have discovered that combining propylene glycol with ethylene glycol results in an unexpectedly reduced toxicity of the resulting fluid, while retaining adequate physical properties to allow the fluid to be used as a non-aqueous heat transfer fluid.

Thus, even if Maes can be read to describe combining ethylene glycol and propylene glycol in a non-aqueous heat transfer fluid, which Applicants dispute, Maes does not teach or suggest combining these materials in the proportions claimed in claims 5, 13, 28-29 and 40-50 to produce a non-aqueous heat transfer fluid having an unexpectedly reduced toxicity. Where a claimed range for combining two items achieves unexpected results, the claimed range is patentable over prior art which does not teach or suggest the claimed range. See In re Woodruff, 919 F.2d 1575, 16 U.S.P.Q. 2d (Fed. Cir. 1990); MPEP § 2144.05. Accordingly, claims 5, 13 28-29 and 40-50, which claim specific combinations of ethylene glycol and propylene glycol with unexpectedly reduced toxicity, are plainly patentable over Maes.

In view of the foregoing remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes after considering these remarks, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

Because the reasons above are sufficient to traverse the rejection, Applicants have not explored, nor do they now present, other possible reasons for traversing such

rejections. Nonetheless, Applicants expressly reserve the right to do so, if appropriate, in response to any future Office Action.

A petition for a one month extension of time and associated fee extending the time to respond to Office Action from July 8, 2003 to August 8, 2003 has been filed herewith. No additional fee is believed to be required. However, if an additional fee is required or otherwise necessary to cover any deficiency in fees paid, authorization is hereby given to charge our Deposit Account No. 50-1631.

Respectfully submitted,

Date: August 8, 2003

  
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